Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (withdrawn): A multi-level system for management of a railway system and its operational components, the railway system comprising:

a first processor associated with a railroad infrastructure level configured to control an operation of a railroad infrastructure operating within the railroad infrastructure level,

a second processor associated with a railroad track network level configured to control an operation of a railroad track network within the railroad track network level, said railroad infrastructure level containing one or more railroad track network levels;

a third processor associated with a train level configured to control an operation of a train operating within the train level, said railroad track network level containing one or more train levels;

a fourth processor associated with a consist level configured to control an operation of a consist of a train within the consist level, said train level containing one or more consist levels; and

a fifth processor associated with a locomotive level configured to control an operation of a locomotive within the locomotive level, said consist level containing one or more locomotive levels;

each processor associated with each level being configured to provide to the processor associated with at least one other level operational parameters that define operational characteristics and data related to the level with which it is associated, and

each processor optimizing the operation within its associated level and to cooperate with a processors associated with at least one other level to optimize an

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operation of the railway system across the levels of the railway system based on an optimization parameter.

Claim 2 (withdrawn): The system of claim 1, wherein the optimization parameter is indicative of fuel usage.

Claim 3 (withdrawn): The system of claim 1 wherein the first processor associated with the railroad infrastructure level receives one or more of:

railroad infrastructure data;

railroad track network data; and

train data; and

controls an operation of a railroad infrastructure within the railroad infrastructure level based at least in part thereon.

Claim 4 (withdrawn): The system of claim 1 wherein the second processor associated with a railroad track network level receives one or more of:

railroad infrastructure data;

railroad track network data; and

train data; and

controls an operation of a railroad track network within a railroad track network level based at least in part thereon.

Claim 5 (withdrawn): The system of claim 1 wherein the third processor associated with a train level receives one or more of:

railroad infrastructure data;

railroad track network data;

train data; and

consist data; and

controls an operation of a train within a train level based at least in part thereon.

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Claim 6 (withdrawn): The system of claim 1 wherein the fourth processor associated with a consist level receives one or more of:

train data;

consist data; and

locomotive data; and

controls an operation of a consist within a consist level based at least in part thereon.

Claim 7 (withdrawn): The system of claim 1 wherein the fifth processor associated with a locomotive level receives one or more of:

consist level data; and

locomotive data; and

controls an operation of a locomotive within the locomotive level based at least in part thereon.

Claim 8 (withdrawn): The system of claim 1 in which the first microprocessor associated with a railroad infrastructure provides output instructions including one or more of:

infrastructure optimization instructions;

commands to a railroad track network; and

commands to a train.

Claim 9 (withdrawn): The system of claim 1 in which the second processor associated with a railroad track network provides output instructions including one or more of:

data to a railroad infrastructure;

track network optimization instructions; and

commands to a train.

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Claim 10 (withdrawn): The system of claim 1 in which the third processor associated with a train provides output instructions including one or more of:

data to a railroad infrastructure;

data to a track network;

train optimization instructions; and

commands to a consist.

Claim 11 (withdrawn): The system of claim 1 in which the fourth processor associated with a consist provides output instructions including one or more of:

data to a train;

consist optimization instructions; and

commands to a locomotive.

Claim 12 (withdrawn): The system of claim 1 in which the fifth processor associated with a locomotive provides output instructions including one or more of:

data to a consist; and

locomotive optimization instructions.

Claim 13 (withdrawn): The system of claim 1 wherein each processor when optimizing the operation within its associated level and cooperating with the processors at the another levels to optimize an operation of the railway system across all levels of the railway system based on an optimization parameter includes identifying key operating constraints and data at each level and communicating these constraints and data to adjacent levels to optimize performance at each level based on the data and constraints of adjacent levels.

Claim 14 (currently amended): A multi-level system for management of a railway system and its operational components, the railway system comprising:

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a first level configured to optimize an operation within the first level, said first level including first level operational parameters defining <u>changes in</u> operational characteristics and data of the first level <u>over a period of time</u>; and

a second level configured to optimize an operation within the second level, said second level including second level operational parameters defining <u>changes in</u> the operational characteristic and data of the second level <u>over a period of time</u>;

said first level providing the second level with the first level operational parameters, and the second level providing the first level with the second level operational parameters; and

said optimizing the operation within the first level and said optimizing the operation within the second level each being a function of optimizing a system optimization parameter.

Claim 15 (original): The system of claim 14 wherein the system optimization parameter is indicative of fuel usage in the railway system .

Claim 16 (original): The system of claim 14 wherein the system optimization parameter is an economic valuation of the time of delivery of cargo carried in the railway system.

Claim 17 (original): The system of claim 14 wherein the operational parameters are provided from one level to the other at predetermined intervals.

Claim 18 (currently amended): The system of claim 14 wherein the operational parameters are indicative of predetermined changes in conditions <u>over the period of time</u>.

Claim 19 (original): The system of claim 18 wherein the operational parameters are indicative of a rate of change in the conditions.

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Claim 20 (original): The system of claim 19 wherein the rate of change is with respect to time.

Claim 21 (original): The system of claim 19 wherein the rate of change is the change in one condition with respect to another.

Claim 22 (original): The system of claim 14 wherein an extent of compliance of the second level with the system optimization parameter is communicated periodically from the second level to the first level for adjusting the first and second level operational parameters based thereon.

Claim 23 (original): The system of claim 14 wherein at least one of the operational parameters is an assumed operational parameter.

Claim 24 (original): The system of claim 14 wherein at least one of the operational parameters is an actual operating parameter.

Claim 25 (original): The system of claim 14 wherein at least one of the operational parameters is based on an anticipated operational condition.

Claim 26 (original): The system of claim 22 wherein optimizing the operation within the first level and optimizing the operation within the second level includes identifying key operating constraints and data at one of the first and second level and communicating these constraints and data to another of the first and second level to optimize performance at the another level.

Claims 27-49 (cancelled).

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Claim 50 (currently amended): A multi-level system for management of a railway system and its operational components, the railway system comprising:

a first level including first level operational parameters defining changes in operational characteristics and data of the first level over a period of time; and

a second level including second level operational parameters configured to optimize an operation within the second level and wherein the second level operational parameters are indicative of changes in operational characteristics and data of the second level over a period of time; and

said second level providing the first level with optimized second level operational parameters.

Claim 51 (original): The system of claim 50 wherein said optimizing the operation within the second level is a function of optimizing a railway system optimization parameter.

Claim 52 (original): The system of claim 51 wherein the system optimization parameter is indicative of a change in fuel usage in the railway system.

Claim 53 (original): The system of claim 51 wherein the system optimization parameter is a change in an economic valuation of the time of delivery of cargo carried in the railway system.

Claim 54 (original): The system of claim 50 wherein the second level operational parameters are provided from the second level to the first at predetermined intervals.

Claim 55 (original): The system of claim 50 wherein the second level is a portion of the first level.

Claim 56 (original): The system of claim 51 wherein the system operational parameter is indicative of a rate of change in second level operational parameters.

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Claim 57 (original): The system of claim 56 wherein the rate of change is with respect to time.

Claim 58 (original): The system of claim 56 wherein the rate of change is the change in one condition with respect to another.

Claim 59 (original): The system of claim 50 wherein the second level operational parameters are assumed operational parameters.

Claim 60 (original): The system of claim 50 wherein the second level operational parameters are actual operating parameters.

Claim 61 (original): The system of claim 50 wherein the second level operational parameters are based on an anticipated operational condition.

Claim 62 (original): The system of claim 50 wherein the first level monitors whether or not the optimized second level operation is within predetermined limits.

Claims 63-75 (cancelled).

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